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(FILE 'HOME' ENTERED AT 16:06:52 ON 27 SEP 2006)
FILE 'CA' ENTERED AT 16:06:59 ON 27 SEP 2006
L1 118 S HERNANDEZ ?/AU AND 2001/PY AND CHEM?/SO
L2 1 S L1 AND MESOSTRU?
L3 17928 S MESOSTRUC? OR MESOPOR?
FILE 'REGISTRY' ENTERED AT 16:12:25 ON 27 SEP 2006
L4 13 S PHENYLENE AND SULFOPROPOXY AND METHOXY AND(POLY OR POLYMER OR
HOMOPOLYMER)
L5 10 S L4 NOT WITH
FILE 'CA' ENTERED AT 16:16:31 ON 27 SEP 2006
L6 42 S L5
L7 2 S L3 AND L6
L8 43 S L3 AND POLYMER(3A) (DOP? OR INCORPORAT? OR IMMOBILI?)
L9 452 S L3 AND(SENSOR OR SENSING OR DETECTOR OR DETECTING)
L10 185 S (SOLGEL OR SOL GEL)AND POLYMER(3A) (DOP? OR INCORPORAT? OR
IMMOBILI?)
L11 220 S (SOLGEL OR SOL GEL)AND (SENSOR OR SENSING OR DETECTOR OR
DETECTING)AND NITRO?
L12 45 S L11 AND POLY?
L13 14 S L10 AND(NITRO? OR TRINITRO? OR DINITRO? OR TNT OR DNT)
FILE 'REGISTRY' ENTERED AT 16:32:29 ON 27 SEP 2006
L14 31 S PLURONIC?
FILE 'CA' ENTERED AT 16:32:46 ON 27 SEP 2006
L15 2896 S L14
L16 856 S (L3 OR SOL GEL OR SOLGEL) AND (L15 OR PLURONIC)
L17 8 S L16 AND POLYMER?(3A) (DOP? OR INCORPORAT? OR IMMOBILI?)
L18 132 S L16 AND(NITRO? OR TRINITRO? OR DINITRO? OR TNT OR DNT)
L19 6 S L6 AND(NITRO? OR TRINITRO? OR DINITRO? OR TNT OR DNT)
L20 69 S L9 AND(NITRO? OR TRINITRO? OR DINITRO? OR TNT OR DNT)
L21 295 S L7-8,L12-13,L17-20
L22 141 S L21 AND PY<2004
L23 10 S L21 NOT L22 AND PATENT/DT
L24 151 S L22-23

=> d bib,ab 124 1-151

L24 ANSWER 18 OF 151 CA COPYRIGHT 2006 ACS on STN
AN 140:182089 CA
TI Spectroscopic studies on conjugated polymers in **mesoporous** channels:
influence of polymer side-chain length
AU Xi, Hongan; Wang, Baohu; Zhang, Yanbo; Qian, Xuefeng; Yin, Jie; Zhu,
Zikang
CS Shanghai Institute of Ceramics, Research and Development Center of
Functional Ceramics, Chinese Academy of Science, Shanghai, 200050, Peop.
Rep. China
SO Journal of Physics and Chemistry of Solids (2003), 64(12), 2451-2455
AB The influence of **mesoporous** environment on the conjugated polymers was
studied by UV-Vis absorption and Photoluminescence spectroscopy. The
applied polymers were three novel poly(p-phenylenevinylene) derivs.
(DDMA-PPV). These polymers have dibenzothiophen-5,5-dioxide units in
their backbones, but are different from each other in the length of
alkoxy side-chains. The **polymers** were **incorporated** into the **mesoporous**

channels of SBA-15 by sorption from their dil. solns. The confined polymers exhibited different trends in the shifts of the absorption onsets and the emission peaks depending on the length of the side-chains. The polymer with shorter side-chain showed red-shifts in both the absorption and emission spectra, whereas the polymer with longer side-chain showed blue-shifts. These phenomena were caused by the combined influences from the electronic confinement and the conformation distortion. Moreover, these trends were enhanced when the polymers were loaded in amine-modified SBA-15.

L24 ANSWER 31 OF 151 CA COPYRIGHT 2006 ACS on STN

AN 139:186341 CA

TI Influence of the block length of triblock copolymers on the formation of **mesoporous** silica

AU Flodstrom, Katarina; Alfredsson, Viveka

CS Physical Chemistry 1, Lund University, Lund, SE-221 00, Swed.

SO Microporous and Mesoporous Materials (2003), 59(2-3), 167-176

AB The effect of different block lengths of **Pluronic** surfactants, (EO)_x-(PO)_y-(EO)_x, in the formation of **mesoporous** SiO₂ was studied. The syntheses were performed in micellar soln. of the surfactant under acidic conditions. The materials were characterized by SAXS, TEM and N adsorption measurements. The EO-block length of the polymers detcs. the **mesostructure** of the SiO₂. For the hexagonal material (SBA-15) the wall thickness is largely dependent on the length of the EO-blocks, while the PO-block length has a great effect on the pore diam. Also, the PO-block length influences the templating ability, as longer PO-blocks result in more highly ordered domains and well defined particles. The synthesis temp. also influences these parameters.

L24 ANSWER 62 OF 151 CA COPYRIGHT 2006 ACS on STN

AN 137:209140 CA

TI Surface photovoltage NO gas **sensor** with properties dependent on the structure of the self-ordered **mesoporous** silicate film

AU Yamada, Takeo; Zhou, Hao-Shen; Uchida, Hidekazu; Tomita, Masato; Ueno, Yuko; Ichino, Toshihiro; Honmu, Itaru; Asai, Keisuke; Katsube, Teruaki

CS National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, 305-8568, Japan

SO Advanced Materials (Weinheim, Germany) (2002), 14(11), 812-815

AB Self-ordered **mesoporous** films were used in the fabrication of NO gas **sensor** devices. The **mesoporous** silicate films were synthesized by spin-coating, using non-ionic polyethylene oxide-polypropylene oxide-polyethylene oxide (PEO-PPO-PEO) triblock copolymer surfactants as the structure directing agents. The precursor for the coating sol soln. was prepd. from two solns., a polymer soln. contg. the template triblock copolymer dissolved in ethanol (EtOH) and a silica soln. contg. a mixt. of tetraethylorthosilicate (TEOS), ethanol, distd. water, and hydrochloric acid. The **sensing** properties of the devices were found to be strongly dependent on the self-ordered **mesostructure** of the films used, which in turn was related to whether the film was hexagonal or cubic in structure.

L24 ANSWER 69 OF 151 CA COPYRIGHT 2006 ACS on STN

AN 136:375354 CA

TI Method for making surfactant-templated thin films
 IN Brinker, C. Jeffrey; Lu, Yunfeng; Fan, Hongyou
 PA Sandia Corporation, USA
 SO U.S., 14 pp.
 PI US 6387453 B1 20020514 US 2000-517873 20000302
 PRAI US 2000-517873 20000302
 AB Disclosed is an evapn.-induced self-assembly method to prep. a porous, surfactant-templated, thin film by mixing a SiO₂ sol, a solvent, a surfactant, and an interstitial compd., evapg. a portion of the solvent to form a liq., cryst. thin film mesophase material, and then removal of the surfactant template. Coating onto a substrate produces a thin film with the interstitial compd. either covalently bonded to the internal surfaces of the ordered or disordered **mesostructure** framework or phys. entrapped within the ordered or disordered **mesostructured** framework. Particles can be formed by aerosol processing or spray drying rather than coating onto a substrate. The selection of the interstitial compd. provides a means for developing thin films for applications including membranes, **sensors**, low dielec. const. films, photonic materials and optical hosts.

L24 ANSWER 90 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 134:258641 CA
 TI Controlled Placement of Luminescent Molecules and Polymers in **Mesostructured** Sol-Gel Thin Films
 AU Hernandez, Raquel; Franville, Anne-Christine; Minoofar, Payam; Dunn, Bruce; Zink, Jeffrey I.
 CS Department of Chemistry and Biochemistry, University of California, Los Angeles, CA, 90095, USA
 SO Journal of the American Chemical Society (2001), 123(6), 1248-1249
 AB Three 1-step methods to design hybrid **mesoporous** SiO₂ thin films in which the desired mol. is deliberately placed in a specified region of the **mesostructure** are demonstrated. The first route involves hydrolysis and condensation of the desired mol. that is derivatized with multiple trialkoxysilane functionalities, demonstrated by Eu³⁺-activated hybrid films prep'd. from tetraethoxysilane and N,N-bis(triethoxysilanepropyl)-2,6-pyridine dicarboxamide. The 2nd approach utilizes an org. conducting polymer contg. sulfonate groups (i.e., water-sol. poly((2,5-methoxypropyloxysulfonate)phenylene vinylene)), which is dissolved in the initial sol, and, as the film is formed, the org. backbone is incorporated in the org. region of the film while the sulfonate groups reside in the ionic interface region. The 3rd approach utilizes an ionic metal complex that is functionalized with 1 alkoxysilane group at the end of a hydrocarbon chain. The alkoxysilane end becomes bonded to the framework in the final **mesostructure**, but the ionic end resides in the ionic interface region. In this case a Ru(II)-complex was used with 1 substituted ethylenediamine and 2 bipyridine ligands. The ethylenediamine is substituted with a Pr chain contg. a trimethoxysilane group that undergoes hydrolysis and condensation to bond to the silicate framework.

L24 ANSWER 92 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 134:72257 CA
 TI Surfactant-induced modification of quenching of conjugated polymer

fluorescence by electron acceptors: applications for chemical sensing
 AU Chen, L.; McBranch, D.; Wang, R.; Whitten, D.
 CS Bioscience Division, Los Alamos National Laboratory, Los Alamos, NM,
 87545, USA
 SO Chemical Physics Letters (2000), 330(1,2), 27-33
 AB Both the photophysics and the fluorescence quenching behavior of an
 anionic conjugated polymer towards various small mol. quenchers can be
 modulated effectively by complexing the polymer with a simple counter-
 charged detergent. For example upon adding dodecyltrimethylammonium
 bromide (DTA) to the polymer, cationic quenchers such as Me viologen
 become less effective while the quenching by neutral reagents - most
 notably **nitroaroms.** or **cyanoaroms.** - is enhanced. Thus, the polymer-
 detergent complex provides a new platform for sensing chem. agents via
 fluorescence quenching. Thin films formed from the complex exhibit high
 sensitivity to quenching by **nitroarom.** vapor and reasonable
 reversibility.

L24 ANSWER 95 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 133:314082 CA
 TI A New Synthesis of **Mesoporous** MSU-X Silica Controlled by a Two-Step
 Pathway
 AU Boissiere, Cedric; Larbot, Andre; van der Lee, Arie; Kooyman, Patricia
 J.; Prouzet, Eric
 CS Laboratoire des Materiaux et Procédés Membranaires, E.N.S.C.M. (CNRS UMR
 5635), Montpellier, F-34296, Fr.
 SO Chemistry of Materials (2000), 12(10), 2902-2913
 AB In the field of micelle templated structures (MTS), the MSU-X family of
mesoporous silica was obtained by using nonionic poly(ethylene oxide)-
 based surfactants. The microstructure of these materials is highly
 dependent on the initial pH conditions and a 1st assembly step, using a
 mild acidity, which allowed the authors to obtain a stable soln. contg.
 micellar hybrid objects made of both surfactant micelles and small
 silica oligomers, can be detd. in the 2-4 pH range. The 2nd step of the
 synthesis consists of the condensation of the silica particles and can
 be performed in two different ways. Either the pH of the stable soln.
 is increased to neutral values or small amts. of fluoride are added.
 With the 2nd method both the nanostructure and the particle morphol. are
 better controlled. This novel two-step synthesis leads in addn. to
 hexagonal pore framework when assembly mols. such as Tween 60 or block
 copolymer **Pluronic** P123 were used as assembly agents.

L24 ANSWER 109 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 132:47041 CA
 TI Highly sensitive biological and chemical sensors based on reversible
 fluorescence quenching in a conjugated polymer
 AU Chen, Liaohai; McBranch, Duncan W.; Wang, Hsing-Lin; Helgeson, Roger;
 Wudl, Fred; Whitten, David G.
 CS Center for Material Science, Los Alamos National Laboratory, Los Alamos,
 NM, 87545, USA
 SO Proceedings of the National Academy of Sciences of the United States of
 America (1999), 96(22), 12287-12292
 AB The fluorescence of a polyanionic conjugated polymer can be quenched by
 extremely low concns. of cationic electron acceptors in aq. solns. We

report a greater than million-fold amplification of the sensitivity to fluorescence quenching compared with corresponding "mol. excited states.". Using a combination of steady-state and ultrafast spectroscopy, we have established that the dramatic quenching results from weak complex formation [polymer(-)/quencher(+)], followed by ultrafast electron transfer from excitations on the entire polymer chain to the quencher, with a time const. of 650 fs. Because of the weak complex formation, the quenching can be selectively reversed by using a quencher-recognition diad. We have constructed such a diad and demonstrate that the fluorescence is fully recovered on binding between the recognition site and a specific analyte protein. In both solns. and thin films, this reversible fluorescence quenching provides the basis for a new class of highly sensitive biol. and chem. sensors.

- L24 ANSWER 117 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 131:32623 CA
 TI Multiphase Assembly of **Mesoporous**-Macroporous Membranes
 AU Zhao, Dongyuan; Yang, Peidong; Chmelka, Bradley F.; Stucky, Galen D.
 CS Chemistry Department Department of Chemical Engineering and Department of Materials, University of California, Santa Barbara, CA, 93106, USA
 SO Chemistry of Materials (1999), 11(5), 1174-1178
 AB Spongelike silica membranes with 3D meso-macrostructures were prep'd. by a novel multiphase process of acid-catalyzed silica **sol-gel** chem. in the presence of inorg. salts such as NaCl and self-assembling ethylene oxide-propylene oxide block copolymer. The macropore dimensions can be controlled according to the sizes of the salt soln. droplets, which can be adjusted by regulating the evapn. rate of the solvent. The mesoscopic structures can be highly ordered 2D honeycomb or 3D cubic configurations, as established by the assembly properties of the amphiphilic block copolymer species. The silica membranes are thermally stable and exhibit large surface areas and pore vols.
- L24 ANSWER 120 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 130:312737 CA
 TI Host-Guest Chemistry Using an Oriented **Mesoporous** Host: Alignment and Isolation of a Semiconducting Polymer in the Nanopores of an Ordered Silica Matrix
 AU Wu, Junjun; Gross, Adam F.; Tolbert, Sarah H.
 CS Department of Chemistry and Biochemistry, University of California at Los Angeles, Los Angeles, CA, 90095-1569, USA
 SO Journal of Physical Chemistry B (1999), 103(13), 2374-2384
 PB American Chemical Society
 AB Oriented polymer/silica composites have been synthesized by **incorporating** the conjugated semiconducting **polymer** MEH-PPV into the pores of an aligned, hexagonally ordered **mesoporous** silica. The ordered silica framework is synthesized by a silica/surfactant coorganization process that proceeds via a silicate/surfactant liq. cryst. intermediate. Magnetic fields are used to orient this liq. cryst. intermediate, followed by chem. crosslinking of the silica framework and removal of the surfactant. Hexagonally ordered (p6mm) aligned silica samples are treated with org. chlorosilanes to optimize interactions between the polymer and the silica surface. **Polymers** are **incorporated** from soln.; thermal cycling is used to drive the polymers into the

pores. The resultant **polymer incorporation** is monitored by polarized photoluminescence spectroscopy. Polymer chains which are oriented in the aligned nanoporous silica show strong polarization anisotropy in their photoluminescence ($IVV/IVH = 4.4$, $IHH/IHV = 0.68$ for vertically oriented pores). Spectroscopic results are compared to the results of a geometric model for transition dipole orientations and used to conclude that as much as 0.8 of the **incorporated polymer** is isolated within the nanopores of the silica matrix, while as little as 0.2 is located in the macroporous regions formed between grains of the silica host. Intentional oxidn. Can be used to degrade the polymer not isolated within the porous silica. After oxidn., essentially all of the photoactive polymer appears to be contained within the oriented silica matrix ($IVV/IVH = 5.7$, $IHH/IHV = 0.71$). The results prove that a semiconducting polymer can be isolated within the pores of an ordered silica host and that this isolation can be used to control the optical properties of the guest mols. (in this case the polarization). Further, the ability to simply characterize the degree of **polymer incorporation** using optical techniques allows us to learn about the effects of processing variables such as the role of surface chem., pore size, and thermal cycling on the final degree of **polymer incorporation**.

- L24 ANSWER 123 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 130:172024 CA
 TI Development of a piezo-optical chemical monitoring system for **nitrogen dioxide**
 AU Colin, Florence; Shepherd, Paul D.; Carter, Timothy J. N.; Wright, John D.
 CS School of Physical Sciences, Centre for Materials Research, University of Kent, Canterbury, CT2 7NR, UK
 SO Sensors and Actuators, B: Chemical (1998), B51(1-3), 244-248
 AB An environmental and occupational chem. monitoring system to measure NO₂ exposure in the range of 10 ppb to 10 ppm/h is reported. The system is based on badges consisting of **sol-gel** entrapped o-tolidine reagent spots deposited on a poled **polyvinylidene fluoride** (PVDF) piezoelec. film. Exposure is measured from the elec. charge produced as a result of stressing the PVDF film by heat generated upon illumination of the reacted spot using a light emitting diode (LED). Calibration and humidity and shelf-life effects are reported, and system advantages are discussed.
- L24 ANSWER 128 OF 151 CA COPYRIGHT 2006 ACS on STN
 AN 128:325304 CA
 TI Effects of **poly**(ethylene glycol) doping on the behavior of pyrene, rhodamine 6G, and acrylodan-labeled bovine serum albumin sequestered within tetramethylorthosilane-derived **sol-gel**-processed composites
 AU Baker, Gary A.; Jordan, Jeffrey D.; Bright, Frank V.
 CS Dep. Chem., Natural Sciences Complex, State Univ. New York, Buffalo, NY, 14260-300, USA
 SO Journal of Sol-Gel Science and Technology (1998), 11(1), 43-54
 AB We investigate the effects of controlled **poly**(ethylene glycol) (PEG) doping on the behavior of pyrene, rhodamine 6G (R6G), and acrylodan-labeled bovine serum albumin (BSA-Ac) sequestered within tetramethylorthosilicate (TMOS)-derived **sol-gel**-processed materials. To

probe the dipolarity of the local environment within the composite we performed static fluorescence measurements on pyrene as the composites aged. We found that small levels of PEG loading effected significant enhancements in the local dipolarity surrounding the av. pyrene mol. Time-resolved fluorescence anisotropy measurements were used to follow the rotational reorientation dynamics of R6H as the composites aged. As the PEG loading increased, the R6G reorientational mobility increased. **Nitrogen** adsorption techniques were used to quantify the effects of PEG doping level on the surface area and final xerogel pore features. A large redn. in surface area was obsd. with PEG doping, but no detectable change in pore size was noted. The effects of PEG doping on a biomol. were proved by following the time-resolved fluorescence anisotropy decay of BSA-Ac. These results showed that PEG doping resulted in increased biomol. dynamics relative to that found for a neat, undoped TMOS-derived composites. Together these results show that PEG doping can be used to tune the **sol-gel**-processed composite dipolarity, alter the mobility of dopants sequestered within the composite, control analyte accessibility to the **sensing** chem., and modulate the internal dynamics within a biodopant.

L24 ANSWER 133 OF 151 CA COPYRIGHT 2006 ACS on STN

AN 127:321915 CA

TI Continuous formation of supported cubic and hexagonal **mesoporous** films by sol-gel dip-coating

AU Lu, Yunfeng; Ganguli, Rahul; Drewien, Celeste A.; Anderson, Mark T.; Brinker, C. Jeffrey; Gong, Weiliang; Guo, Yongxing; Soye, Hermes; Dunn, Bruce; Huang, Michael H.; Zink, Jeffrey I.

CS Sandia National Lab., Advanced Materials Lab., Univ. New Mexico/NSF Center Micro-Eng. Materials, Albuquerque, NM, 87106, USA

SO Nature (London) (1997), 389(6649), 364-368

AB Thin films of surfactant-templated **mesoporous** materials could find applications in membrane-based sepns., selective catalysis and **sensors**. Above the crit. micelle concn. of a bulk silica-surfactant soln., films of mesophases with hexagonally packed one-dimensional channels can be formed at solid-liq. and liq.-vapor interfaces. But this process is slow and the supported films are granular and with the pore channels oriented parallel to the substrate surface, so that transport across the films is not facilitated by the pores. Ogawa has reported a rapid spin-coating procedure for making transparent **mesoporous** films, but their formation mechanism, microstructure and pore accessibility have not been elucidated. Here we report a sol-gel-based dip-coating method for the rapid synthesis of continuous **mesoporous** thin films on a solid substrate. The influence of the substrate generates film **mesostructures** that have no bulk counterparts, such as composites with incipient liq.-cryst. order of the surfactant-silica phase. We are also able to form **mesoporous** films of the cubic phase, in which the pores are connected in a three-dimensional network that guarantees their accessibility from the film surface. We demonstrate and quantify this accessibility using a surface-acoustic-wave **nitrogen**-adsorption technique. We use fluorescence depolarization to monitor the evolution of the mesophase in situ, and see a progression through a sequence of lamellar to cubic to hexagonal structures that has not previously been reported.

L24 ANSWER 144 OF 151 CA COPYRIGHT 2006 ACS on STN
AN 121:21758 CA
TI New photonics media prepared by **sol-gel** process
AU Burzynski, R.; Casstevens, M. K.; Zhang, Y.; Zieba, J.; Prasad, P. N.
CS Laser Photon. Technol., Inc., Amherst, NY, 14228, USA
SO Proceedings of SPIE-The International Society for Optical Engineering
(1993), 1853(Organic and Biological Optoelectronics), 158-62
AB The earliest and most prodigious development in photonics technol. will
be in the area of 2nd-order nonlinear optical processes: 2nd-harmonic
generation and electrooptic modulation. Photonics applications will
undoubtedly involve an integration of fast and reliable high-speed
optical crossbar switches, elec. field **sensing** devices, and beam
alignment of read-write heads for optical data storage in optical
computers. The requirements for such devices are very rigorous, and
their development relies on employing photonics materials whose linear
and nonlinear optical properties can be engineered. There are several
org. materials that are being developed into viable devices due to the
fact that their $\chi(2)$ nonlinearities are much higher than those of
existing dielects. The most recent materials applied to integrated
optics have been the **sol-gel** processed glasses and glass/**polymer**
nanocomposites which have the inherent advantages of being more easily
processed and are cost effective. The recent developments of studies
involving linear and nonlinear optical properties of some novel **sol-gel**
processed inorg. oxides/org. **polymer** composites for nonlinear optics and
photonics applications are reported.

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STN INTERNATIONAL LOGOFF AT 16:41:45 ON 27 SEP 2006